

In the claims:

1-10. (Cancelled)

11. (Currently Amended) A metal-to-metal antifuse disposed between two metal interconnect layers in an integrated circuit comprising:

a tungsten plug disposed in a via in an insulating layer disposed above and in electrical contact with a lower metal interconnect layer;

~~a first layer of a barrier metal disposed above and in electrical contact with said tungsten plug forming a first electrode, said first layer of said barrier metal comprising a material selected from a group consisting of at least one of tantalum and tantalum nitride;~~

an antifuse layer disposed above an upper surface of said tungsten plug, said antifuse layer comprising a lower adhesion-promoting layer, a middle layer comprising amorphous carbon, and an upper adhesion-promoting layer;

a layer of a barrier metal disposed over said antifuse layer forming a second electrode, said layer of said barrier metal comprising a material selected from a group consisting of at least one of tantalum and tantalum nitride; and

a second insulating layer disposed over said ~~first~~ insulating layer, said antifuse layer, ~~said first layer of said barrier metal~~, and said ~~second~~ layer of said barrier metal.

12. (Original) The metal-to-metal antifuse of Claim 11, wherein said layer of amorphous carbon is doped with at least one of hydrogen, fluorine, and hydrogen and fluorine.

13. (Canceled)

14. (Original) The metal-to-metal antifuse of Claim 11, wherein said antifuse layer is about 10 nm to about 80 nm in thickness.

15. (Previously Presented) The metal-to-metal antifuse of Claim 11, wherein said layer of said barrier metal layer is about 25 nm to about 200 nm in thickness.

16. (Previously Presented) The metal-to-metal antifuse of Claim 11, wherein said lower adhesion-promoting layer comprises amorphous silicon carbide, said middle layer comprises amorphous carbon, and said upper adhesion-promoting layer comprises amorphous silicon carbide.

17. (Previously Presented) The metal-to-metal antifuse of Claim 11, wherein said lower adhesion-promoting layer comprises amorphous silicon nitride, said middle layer comprises amorphous carbon, and said upper adhesion-promoting layer comprises amorphous silicon nitride.

18. (Currently Amended) The metal-to-metal antifuse of Claim 11, further comprising an oxide layer disposed on said ~~second~~ layer of said barrier metal layer.

19. (Original) The metal-to-metal antifuse of Claim 11, further comprising a tungsten layer disposed on said second layer of said barrier metal layer.

20-52. (Canceled)